

## IN THE CLAIMS:

1. (Currently amended) A ~~peptide or~~ protein useful in the diagnosis, treatment or prophylaxis of a disease caused by a coronavirus or related virus comprising a selected peptide sequence from the S gene protein of a coronavirus strain, optionally fused in frame to a ~~gene sequence encoding a selected fusion partner protein or portion thereof~~.
2. (Currently amended) The protein according to claim 1 wherein ~~the S gene is obtained from the feline~~ said coronavirus, is Feline Infectious Peritonitis Virus.
3. (Original) The protein according to claim 1 wherein said coronavirus is selected from the group consisting of WT FIPV DF2, WT FIPV WSU 1146, TS FIPV, WT FIPV UCD-2, WT FIPV TN406, WT FIPV UCD-1, FIPV DF2-HP, and FIPV TS-BP.
4. (Currently amended) The protein according to claim 1 wherein the S gene protein is obtained from the feline coronavirus, FECV.
5. (Canceled)
6. (Currently amended) The protein according to claim ~~5~~ 1 wherein said S protein is from FECV or FIPV, and said selected S gene sequence encodes a peptide comprising a sequence homologous to sequence comprises amino acid numbers 18 - 26, 46 - 53, 73 - 78, 124 - 174, 145 - 150, 138 - 159, 143 - 150, 200 - 205, 529 - 536, 1-748, 1-223, 1-360, 93-223, 94 -223, 97-222, 121-180, 137-151, 213-362, 352-748, 892 -1040, and 94-748 of said S protein, or a fragment thereof.
7. (Currently amended) The protein according to claim ~~4~~ 6 wherein ~~said selected S gene sequence encodes a peptide comprising amino acid numbers 94-223 of said S protein~~ comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 22, SEQ ID NO: 26 and SEQ ID NO: 32.

8. (Currently amended) The protein according to claim 1, ~~comprising a~~ wherein said peptide sequence is selected from the group consisting of amino acid numbers 18—26 [(SEQ ID NO: 36)], 46—53 [(SEQ ID NO: 38)], 73—78 [(SEQ ID NO: 40)], 124—174, 145—150 [(SEQ ID NO: 42)], 138—159 [(SEQ ID NO: 44)], 143—150 [(SEQ ID NO: 46)], 200—205 [(SEQ ID NO: 48)], and 529—536 [(SEQ ID NO: 50)] from FECV, or corresponding peptides of FIPV, corresponding peptides of the consensus sequence, and fragments thereof, said peptides capable of distinguishing between FIPV strains and FECV.

9. (Currently amended) The protein according to claim 1 wherein said selected fusion partner protein is selected from the group consisting of galactokinase, beta-galactosidase, ubiquitin,  $\alpha$  mating factor, and influenza NS-1 or portions thereof.

10. (Currently amended) The protein according to claim 9 wherein said selected fusion partner protein comprises the N-terminal 52 amino acids of galactokinase.

11-12. (Canceled)

13. (Currently amended) A DNA sequence encoding the protein according to any one of claims 1 or 6-8, useful in the diagnosis, treatment or prophylaxis of a disease caused by a coronavirus or related virus ~~comprising a selected nucleotide sequence from the S gene of a feline coronavirus strain.~~

14-22. (Canceled)

23. (Currently amended) A method for recombinant production of a ~~recombinant protein useful in the diagnosis, treatment or prophylaxis of diseases caused by feline coronaviruses~~ the protein according to claim 1, comprising culturing a selected host cell transformed with a DNA molecule which comprises a nucleotide sequence encoding a ~~selected sequence from the S gene of a feline coronavirus strain, optionally fused in frame to a gene sequence encoding a selected fusion partner~~ said protein, wherein said nucleotide sequence is in operative association with regulatory sequences capable of regulating the expression of said

protein.

24-27. (Canceled)

28. (Currently amended) The method according to claim 23 wherein said ~~cells are~~  
cell is a bacterial cells cell.

29. (Currently amended) The method according to claim 23 wherein said ~~cells are~~  
cell is an E. coli cells cell.

30. (Canceled)

31. (Currently amended) A recombinant DNA molecule comprising a DNA sequence  
coding for ~~a selected portion of a feline coronavirus S gene, optionally fused in frame to a DNA~~  
~~sequence encoding a selected portion of a fusion partner protein~~ the protein according to any one  
of claims 1 or 6-8, said DNA sequences in operative association with regulatory sequences  
capable of directing the expression ~~thereof~~ said protein in host cells.

32-35. (Canceled)

36. (Currently amended) A vaccine composition comprising an immunogenic  
amount of ~~a feline coronavirus protein comprising a selected sequence from the S gene of a~~  
~~feline coronavirus strain, optionally fused in frame to a gene sequence encoding a selected fusion~~  
~~partner protein or portion thereof~~ the protein according to claim 1 and ~~an optional~~ a carrier.

37. (Canceled)

38. (Original) The vaccine composition according to claim 36 comprising at least 1-  
10 feline coronavirus S fusion proteins per ml.

39-43. (Canceled)

44. (Currently amended) A method for vaccinating a naive animal against Feline Infectious Peritonitis Virus which comprises internally administering to the animal an effective immunogenic amount of a the protein according to claim 1.

45. (Canceled)

46. (Currently amended) A pharmaceutical composition for treating Feline Infectious Peritonitis Virus infection in an infected animal comprising an effective non-toxic amount of a ~~feline coronavirus protein comprising a selected sequence from the S gene of a feline coronavirus strain, optionally fused in frame to a gene sequence encoding a selected fusion partner protein or portion thereof~~ the protein according to claim 1 and an optional a pharmaceutical carrier.

47-48. (Canceled)

49. (Currently amended) A method for distinguishing one coronavirus from another coronavirus, ~~including one species coronavirus from another species coronavirus, comprising~~ employing a the protein of claim 1 according to any one of claims 1 or 6-8, a primer sequence of Table II (SEQ ID NO: 1 through SEQ ID NO: 18), ~~or a DNA sequence according to claim 13~~ encoding the protein according to any one of claims 1 or 6-8, or an antibody to the protein according to any one of claims 1 or 6-8. 4

50. (Currently amended) An antibody to a ~~peptide or~~ the protein according to claim 1 any one of claims 1 or 6-8, said antibody capable directed to an epitope capable of distinguish FIPV strains and FECV.

51. (New) A peptide consisting of an amino acid sequence selected from the group consisting of amino acid residue numbers 1 to 748, 1 to 223, 1 to 360, 93-223, 94 to 223, 97 to

44. (Currently amended) A method for vaccinating a naive animal against Feline Infectious Peritonitis Virus which comprises internally administering to the animal an effective immunogenic amount of a the protein according to claim 1.

45. (Canceled)

46. (Currently amended) A pharmaceutical composition for treating Feline Infectious Peritonitis Virus infection in an infected animal comprising an effective non-toxic amount of a ~~feline coronavirus protein comprising a selected sequence from the S gene of a feline coronavirus strain, optionally fused in frame to a gene sequence encoding a selected fusion partner protein or portion thereof~~ the protein according to claim 1 and an optional a pharmaceutical carrier.

47-48. (Canceled)

49. (Currently amended) A method for distinguishing one coronavirus from another coronavirus, ~~including one species coronavirus from another species coronavirus,~~ comprising employing a ~~the protein of claim 1~~ according to any one of claims 1 or 6-8, a primer sequence of Table II (SEQ ID NO: 1 through SEQ ID NO: 18), ~~or a DNA sequence according to claim 13~~ encoding the protein according to any one of claims 1 or 6-8, or an antibody to the protein according to any one of claims 1 or 6-8.

50. (Currently amended) An antibody to a ~~peptide or the protein according to claim 1~~ any one of claims 1 or 6-8, said antibody capable directed to an epitope capable of distinguish FIPV strains and FECV.

51. (New) A peptide consisting of an amino acid sequence selected from the group consisting of amino acid residue numbers 1 to 748, 1 to 223, 1 to 360, 93-223, 94 to 223, 97 to

222, 121 to 180, 137 to 151, 213 to 362, 352 to 748, 892 to 1040, and 94 to 748, of an S protein comprising an amino acid sequence as set forth in SEQ ID NO: 22, SEQ ID NO: 26, or SEQ ID NO:32.

52. (New) A peptide consisting of an amino acid sequence selected from the group consisting of:

- (a) SEQ ID NO: 36;
- (b) SEQ ID NO: 38;
- (c) SEQ ID NO: 40;
- (d) SEQ ID NO: 42;
- (e) SEQ ID NO: 44;
- (f) SEQ ID NO: 46;
- (g) SEQ ID NO: 48;
- (h) SEQ ID NO: 50;
- (i) SEQ ID NO: 52; and
- (j) a peptide from an FIPV S protein which sequence

corresponds in size and position to any of sequences (a) - (i).

53. (New) A DNA sequence encoding the peptide according to claim 51 or 52.

54. (New) A vaccine composition comprising an immunogenic amount of the peptide of claim 51 or 52, and a pharmaceutical carrier.

55. (New) An antibody to the peptide according to claim 51 or 52.

56. (New) A method for distinguishing one coronavirus from another coronavirus, comprising employing the peptide of claim 51 or 52, a DNA sequence encoding the peptide of claim 51 or 52, or an antibody to the peptide of claim 51 or 52.